In a paper in the *Cleveland* (U.S.) *Herald*, November 14, entitled "Archæological Frauds," Col. Whittlesey examines some of the recent so-called prehistoric finds in some parts of the United States, and comes to the conclusion that most of them are extremely suspicious; among these is the well-known Grave Creek inscription.

The New York Aquarium, some account of which we gave recently, is publishing a fortnightly journal. Of course it is essentially popular, but, while keeping an eye to the success of the aquarium, it gives considerable information concerning its inhabitants.

We have received from New South Wales several papers which show that there is a creditable amount of activity in connection with science in that colony. We recently published a brief account of two meetings of the Royal Society of the colony, and from the rules, list of members, and other documents in connection with that body, which have been sent us, we have hopes that it will become an important centre of scientific influence and culture. We believe that the recent development of the Society is greatly due to the energy of the hon. secretary, Prof. Liversidge. "New South Wales; its Progress and Resources," is the title of a paper prepared by the authority of the Commissioners for the Philadelphia Exhibition, and giving, in brief space, an interesting account of the rapid progress of the colony. Along with this is a mineral map of New South Wales, showing the localities of the principal minerals, the back being utilised for the tabulation of some important statistics. As text to this map is a long and valuable paper by Prof. Liversidge giving a complete account of the minerals of the colony. Finally, we have by the same gentleman, a "Report of the Sugar-Cane Disease in the May River District, Queensland."

We noticed some time ago the opening of Mr. Rooke Pennington's local museum at Castleton, in Derbyshire. We are informed that the result has been a great impetus to scientific study in that and the neighbouring Peak villages, and that a course of lectures has been arranged in connection with the museum. The first lecture will be delivered by Mr. Ralph Betley, F.G.S., who will take as a subject "Water." Mr. C. E. De Rance will give the second.

A very valuable and interesting collection of silver ores from Chili and Bolivia was sold by auction the other day by Mr. Stevens at his sale rooms in King Street, Covent Garden. Some of the specimens realised very high prices, one piece of red silver about the size of an orange being bought by Mr. H. Ludlam for 200*l.*, another about a quarter the size, with very perfect crystals, was secured by Mr. Bryce M. Wright, the mineralogist, for 100 guineas, and the remainder, comprising about 100 small specimens, were sold at proportionate prices; we believe Mr. Wright bought nearly a third of the collection, which was probably one of the finest ever brought to England.

This year Dr. Hermann Müller was accompanied to the Alps by one of his pupils, Ed. Gaffron, who collected, prepared, and carefully mounted fine specimens of all those Alpine flowers which Dr. Müller has observed and described, or will describe, in Nature, in his articles on the Fertilisation of Flowers by Insects. Twenty complete collections have been made, and the young collector is anxious to sell them in order to raise funds to accompany Dr. Müller next summer. No doubt a number of our readers will desire to possess such a collection, which may be obtained by writing to Eduard Gaffron, Realschule, Lippstadt. The price, we believe, of a single collection is fifteen shillings.

The additions to the Zoological Society's Gardens during the past week include a Patas Monkey (*Cercopithecus ruber*) from West Africa, presented by Mr. J. W. Feather; an Australian Crane (*Grus australasiana*) from Australia, presented by Mr. H. Roberts; two Crested Guinea Fowls (*Numida cristata*) from West Africa, presented by Mr. Daniel R. Ratcliff; two King Parrakeets (*Aprosmictus scapulatus*) from New South Wales, presented by Miss E. Rigby; a Short-eared Owl (*Otus brachyotus*), European, presented by Mr. W. R. Stanley; a Snowy Owl (*Nyctea nivea*), European, presented by Mr. John Kendall; a Brown Capuchin (*Cebus fatuellus*) from South-east Brazil; a Kinkajou (*Cercoleptes caudivolvulus*) from South America, a Royal Python (*Python regius*), a West African Python (*Python sebæ*) from West Africa, deposited.

SOCIETIES AND ACADEMIES

London

Linnean Society, December 7.—Mr. G. Bentham, vice-president, in the chair.—Mr. Francis Day read Part I. of the "Geographical Distribution of the Fresh-water Fishes of India." This contribution aims towards solving the vexed question of whether the fauna of Hindostan is mostly African or Malayan. The author first separates the true fresh-water species from those which enter rivers from the sea for breeding or predacious purposes. Out of nine families of Spiny-rayed fish (Acanthopterygians), only two are likewise found in the African region, but one of these is in Madagascar, which is doubtfully African; the other is also found in the Malay Archipelago, which possesses representatives of eight out of nine families. Each of the forty-five known species is then followed out, and the author considers that the Indian and Malayan fauna (of the group in question) are essentially identical, whereas the species are scarcely represented in Africa. The fresh-water fishes of Ceylon, the Andamans and Nicobars, he believes, are also strictly Indian, whilst as these fishes cannot be spread except by line of fresh-water communication, it thus appears highly probable that these islands were at one period connected to the continent of India. Moreover, certain forms exist in Malabar which are absent from the rest of India, but reappear in the regions of Chittagong or Siam.—Mr. J. G. Baker gave the substance of an exhaustive memoir on a general systematic arrangement of the Iridaceæ (the Iris family). Nearly all the Iridaceæ inhabit temperate regions, and may be grown successfully in the open air in this country. Some are among our most familiar garden genera—for instance, the Crocus, the Iris, and the Gladiolius. Altogether about 700 species and sixty-five genera are now recognised. In his present classification the structure of the perianth mainly guides the author to adopt three primary divisions—(1) Ixieæ, (2) Irideæ, and (3) Gladioleæ, the above common garden plants serving respectively as typical examples of these groups. The three divisions in question are again subdivided into—(*a*) Those having *bulbs with free stamens*; (*b*) Those having *bulbs with monadelphous stamens*; (*c*) Those *wanting bulbs, but with free stamens*: (*d*) Those also *devoid of bulbs with monadelphous stamens*. As regards distribution, 312 genera are found at the Cape; in Europe and North Africa, 94; Temperate Asia, 89; Tropical America, 82; Tropical Africa, 56; South America, 34; Australia, 31; and Polynesia, 1.—The Rev. W. A. Leighton communicated a description of eleven new British Lichens, seven of these belonging to the genus *Lecidea*, one to *Odontotrema*, and three to *Verrucaria*.—The Chairman passed some remarks on a folio treatise concerning the structure and culture of the quinine-bearing trees (*Cinchona*) in our East Indian Plantations, by I. E. Howard, F.R.S.—Mr. T. Christy exhibited specimens of the so-called Black Coral (*Antipathes*) from the Philippines, referring to its commercial value.—Thirteen gentlemen were elected Fellows of the Society.

Zoological Society, December 5.—Dr. E. Hamilton, vice president, in the chair.—A letter was read from Count T. Salvadori, announcing that a new species of Paradise-bird, of the genus *Drepanornis*, had been discovered near the most inland point of Geelvink Bay, New Guinea.—A communication was read from Mr. Andrew Anderson, containing some corrections of and additions to previous papers on the Raptorial Birds of North Western India.—Mr. Francis Day read a paper on the fishes collected by the Yarkand Mission, in 1873, to which the late Dr. Stoliczka was attached as naturalist. The paper gave an outline sketch of the fresh-water fishes of Hindustan, Afghanistan, Western Turkestan, Yarkand, Tibet, and Cashmere. The author showed that the principal fishes of Yarkand belong to a

local group of carps, termed "Hill Barbels, or *Schizothoracinæ*," by McClelland: that this group is almost restricted to cold and elevated regions, spreading to the most eastern portion of Western Turkestan, Afghanistan, and along the western slopes of the Himalayas to China; and that these forms are entirely distinct from the carps of the plains to the south of the Himalayas.—A communication was read from Mr. Martin Jacoby giving the descriptions of new genera and species of Phytophagous Coleoptera.—A communication was read from Dr. A. Günther, F.R.S., containing the description of a new species of lizard from Asia Minor, which he proposed to name *Zootoca danfordi* after Mr. C. G. Danford, its discoverer.—Dr. Günther communicated a paper by Mr. W. Ferguson, of Colombo, containing the description of a new species of snake of the genus *Aspidura* from Ceylon, for which the name of *A. guentheri* was proposed.

Geological Society, November 22.—Prof. P. Martin Duncan, F.R.S., president, in the chair.—The following communications were read:—On the pre-Cambrian (or Dimetian) rocks of St. David's, by Henry Hicks, F.G.S. Referring to the ridge of pre-Cambrian rocks, which he described in a former paper as running down the St. David's promontory, and as previously supposed to consist of intrusive syenite and felstone, the author stated that he had now found it to be composed exclusively of altered sedimentary rocks of earlier date than the Cambrian deposits, the conglomerates at the base of which are chiefly made up of pebbles derived from these rocks. Recent investigations had led him to the conclusion that the main ridge was composed of two distinct and decidedly unconformable formations, the older of which, composed of quartzites and altered shales and limestones, constituting the centre of the ridge, has a north-west and south-east strike, and dips at a very high angle; whilst the newer series, consisting of altered shales, and having at its base a conglomerate composed of pebbles of the older rock, has a strike nearly at right angles to that of the latter. For the former he proposed the name of Dimetian, and for the latter that of Pebidian. The author indicated the points of resemblance between these pre-Cambrian rocks and the Laurentian of Canada, the Malvern rocks, and others in Scotland and elsewhere, but thought it safer at present to abstain from attempting any definite correlation of them. The exposure of the older, or Dimetian series, led the author to ascribe to those rocks a thickness of at least 15,000 feet; the upper, or Pebidian rocks, which flank both sides of the old ridge through a great portion of its length, are apparently of considerably less thickness, but they are in most parts more or less concealed by Cambrian deposits overlying them unconformably. Running nearly parallel with Ramsey Sound is another large mass of the author's Pebidian rocks, and at the south-western extremity of Ramsay Island they compose a bold hill almost 400 feet high, and on the east side of this a fault, with a downthrow of at least 14,000 feet, has brought the Arenig beds into contact with the pre-Cambrian rocks.—On the fossil vertebrates of Spain, by Prof. Salvador Calderon, communicated by the President.

Anthropological Institute, November 28.—Col. A. Lane Fox, F.R.S., president, in the chair—An Indian hammock from the city of Mexico, weapons from Perak and British Guiana and a Bosjesman's skull were exhibited.—The President, by permission of Messrs. Bollin and Feuardent, exhibited some terra cotta figures from Tanagra, Bœotia, and read some notes thereon. Mr. Hyde Clarke and others joined in the discussion.—Papers on the Lapplanders, by A. von Humboldt von Horck, and on the tribes of British Guiana, by the Rev. D. Harper, were also read.

Royal Microscopical Society, December 6.—H. C. Sorby, F.R.S., president, in the chair.—The President exhibited a *facsimile* of Jancen's microscope, made by permission of the Dutch Government from the original, exhibited at the South Kensington Loan Collection.—A paper by the Rev. W. H. Dallinger was read by the Secretary, on *Navicula crassinervis*, *N. rhomboides* and *Frustulia saxonica*, as test objects, in which, after referring at some length to the recent discussion upon the subject of their identity or difference, he expressed his belief that they were all specimens of *Rhomboides*, differing only as to size; and in support of his opinion, a number of very beautifully executed drawings were exhibited to the meeting, showing the microscopical appearance of the diatoms in question under a magnifying power of 800 diameters.

Institution of Civil Engineers, November 28.—Mr. George Robert Stephenson, president, in the chair.—The paper read was on the chalk water system, by Mr. J. Lucas.

CAMBRIDGE

Philosophical Society, November 20.—Mr. O. Fisher read a communication on the effect of convective currents on the distribution of heat in a bore-hole. This paper was supplementary to one read by the author on November 29, 1875. The temperatures obtained in the boring at Speremberg, near Berlin, which attained a depth of upwards of 4,000 feet, were reduced to a mean law by Prof. Mohr, of Bonn, and had been already shown by the author to conform closely to those expressed by a parabolic curve, having its axis horizontal, and its vertex at a depth of 5,171 feet expressed by the equation—

$$v = -\frac{251}{10^8}x^2 + 0{\cdot}012982\,x + 7{\cdot}1817,$$

v being the temperature expressed in Reaumur's scale, and x the depth. An elaborate account of the observations taken in the Speremberg boring has been given by Dunker in a paper entitled "Ueber die Benutzung tiefer Bohrlöcher zur Ermittelung der Temperatur des Erdkörpers, und die desshalb in dem Bohrloche zu Speremberg auf Steinsalz angestellten Beobachtungen." The temperature curve within the earth's crust being believed to be a straight line expressing an increase of 1° Fahr. for 60 feet of descent, it was shown that the departure from this law in a large bore-hole (in the present case a foot in diameter) might be accounted for by vertical currents. At the surface of the water its temperature, from radiation and evaporation, will nearly coincide with that of the upper bed of rock. As we descend, the tendency will be for the currents to warm the water in the upper part of the bore-hole above the normal temperature of the rock, and to cool it in the lower part below the temperature of the rock. At a certain depth the temperatures of the water and rock would be the same. By Dunker's table this appears to have occurred at the depth of about 200 feet. A diagram representing graphically the effects mentioned will appear, accompanied by the proper explanations, in the forthcoming number of the Society's *Proceedings*.—Prof. Hughes then gave a criticism of the evidence for pre-glacial man, which we have already noted.

MANCHESTER

Literary and Philosophical Society, October 31.—Rev. William Gaskell, M.A., in the chair.—Remarks on the general affections of the barometer noticed by Mr. J. A. Broun, by Prof. B. Stewart, LL.D., F.R.S. Mr. J. A. Broun has found as an experimental fact that simultaneous variations of the barometric pressure occur at such distant portions of the globe as to lead to the inference that the whole globe is thus affected, from which Mr. Broun infers that some other force besides gravity is concerned in these phenomena. We know as a matter of fact that there are causes at work which give rise to electrical separation, although we may not know the precise nature of these causes. Thus evaporation goes on from the surface of the sea and of the land. Changes take place in the amount of aqueous vapour held by the air, and also probably in the molecular state of this aqueous vapour. But although we may not be able to point to the specific actions which produce electrical separation, we know that such separation implies a one-sidedness or heterogeneity; and since gravity will presumably act differently on the two things, we may probably suppose that one of the constituents which have caused this electrical separation may have a tendency to mount upwards in the atmosphere, while the other may have a tendency to move downwards. For instance, if evaporation from the surface of the earth or sea be one cause of this electrical separation, we might imagine the land or sea to become electrified in one way, while the vapour electrified in the other direction might mount in the air, owing to its being specifically lighter. In fine, whatever be the cause of the electrical separation, we may presumably suppose that the one constituent will either remain below or find its way downwards, while the other, carrying with it its peculiar electricity, will mount upwards. Now, may not the earth be regarded as a Leyden jar, the sea and earth forming one coating, and the upper, rarer, and hence electrically conducting strata of air forming the other coating; and will not the tendency of the action above named be to charge the upper coating with one kind of electricity and the under with another? Such a process would, of course, be continually going on, while on the other hand the earth, regarded as a Leyden jar, would, by means of thunderstorms, and possibly by other means, be continually discharging itself. Next, let us suppose that by some extensive local circumstances a greater than usual electrical separation and charging of the earth jar has

been going on. The effect of this local cause would, however, not be local, but would contribute to increase the charge of the earth as a whole—as one jar in fact, so that the earth as a whole might, for a short period, be increasing its charge—the local charging causes being in excess of the local discharges. Next, would not this excessive charge appear to increase the barometric pressure of the air over the whole earth? On the other hand we may imagine the discharging influences to be sometimes in excess of the charging causes, and then the electrical separation of the earth jar would diminish, and the barometric pressure of the air appear to diminish also. These remarks are put forward not as a formal theory, but rather with the view of inviting discussion. In considering a fact such as that brought forward by Mr. Broun, we must first endeavour to explain it by the operation of some known cause. I have therefore introduced a force which we know to exist, and a mode of operation which is not at first sight improbable. It may be thought that electrical separation can hardly be great enough to produce a sensible barometrical difference. Let this be proved, and a point will be gained by the dismissal of what seems at first sight a possible hypothesis. Meanwhile—to bring these remarks to a practical issue—might it not be well to examine the records of atmospherical electricity corresponding to the dates of Mr. Broun's observations with the view of ascertaining whether Mr. Broun's results are in any way connected with the electrical state of the earth's envelopes?

GENEVA

Physical and Natural History Society, October 5.—Prof. Plantamour communicated to the Society the continuation of his investigations into the climate of Geneva, dealing especially with winds, cloudiness, and rain. As to winds, he has obtained for the last fifteen years a confirmation of the previous results, viz., that the local winds at Geneva play an important part in consequence of the action of the lake; the land breeze at the lake giving a south wind, prevails in the warm season, especially during the morning and evening hours. Generally the south wind prevails from April to October, while the *bise*, or north wind, prevails from November to March. With regard to cloudiness, M. Plantamour has established that the daily variation changes in a notable manner with the season. In winter the minimum of nebulosity occurs at 4 P.M., while in summer it is the afternoon hours that are most overcast. In winter it is the night cold which is the principal cause of clouds; in summer the afternoon heat. December is the most cloudy month; July and August are the clearest months, with difference from one year to another. Examining next the period of fifty years from 1826 to 1875, in reference to the quantity of rainfall, M. Plantamour arranges the years into very dry, dry, wet, and very wet, according to the proportion of rain which they have given, as compared with the mean. It follows from this classification that years of different qualities succeed each other in an order entirely irregular; that a year may be followed as likely by a similar as by a different or very different year in point of humidity. However, there are series of years in which the rainy prevail, and others in which the dry prevail. Thus, from 1826 to 1837 there were eight dry years and four wet; from 1838 to 1856, fourteen wet years and five dry years; from 1857 to 1865, six dry years and three wet. Still there is no regularity, no periodicity in the return of these dry and wet epochs, nothing especially which we may connect with the eleven-year period of sun-spots.

PARIS

Academy of Sciences, December 4.—Vice-Admiral Paris in the chair.—The following papers were read:—On a note of P. Secchi relative to the formation of hail, by M. Faye. He is surprised at P. Secchi giving out as new the idea of trombes with vertical axes bringing down cold air from the upper regions. He urges the sun-spot analogy.—Indices of a new genus of edentate mammifera, fossil in the Saint Ouen Eocene deposits, by M. Gervais. The peculiarities of some of the fragments (chiefly a calcaneum, and metatarsal or metacarpal bones) are described. The animal seems to have been like *Macrotherium* and *Ancylotherium* in some respects, unlike in others. M. Gervais names the genus *Pernatherium*, and the species *P. rugosum*, in allusion to the wrinkles on many of its bones.—Preparation of alcohol by means of sugar contained in the leaves of beets, by M. Pierre. He calculates that 34 kilogrammes of juice of the leaves may yield 0·198 litre of absolute alcohol the leaves of 1 hectare about 173 litres. At the moment of removal the leaves contained nearly 350 kilogrammes of sugar per hectare.—M. de Lesseps, presenting a *brochure* on Africa and the Geographical Conference at Brussels, explained the scheme of the King of Belgium of an international association for opening and civilising Central Africa.—On the employment of iodide of potassium in lead colic and paralysis, according to M. Melsens' method, by M. Jacobs. The patient takes 1 gramme a day, and increases the dose by 1 gramme up to 6, 8, 10, 12, or 15 grammes, then returning gradually to the initial dose. The more iodide he can bear the sooner is he cured.—Researches on the devitrification of vitreous rocks, by M. Meunier. M. Levy's facts do not seem to him to furnish any argument against the production of crystalline rocks at expense of vitreous rocks, by way of devitrification.—Results obtained by the decortication of vine stocks, by M. Sabaté.—Report on the experiments made by the Paris-Lyons-Mediterranean Company for combating phylloxera, by M. Marion. They commend sulphide of carbon and sulpho-carbonates, which should be applied when the products of the winter eggs have descended to the roots, *i.e.*, about July. The old phylloxera of the roots is thus treated as well.—Scale of platinised iridium (4 m.) of the International Geodesic Association, by M. Matthey. Observations on this communication, by M. H. Sainte-Claire Deville, also by MM. Tresca and Dumas. M. Tresca remarked on the high density, about 21·50. If it contained only 10 per cent. of iridium, $\frac{1}{1000}$ of rhodium, and $\frac{1}{1000}$ of ruthenium, the manufacture of metals of platinum must have been greatly improved since 1872.—Observation of a new star in the constellation of Cygnus, by M. Schmidt, director of the Athens Observatory.—Observations of the planet (169) Zelia, discovered at the Observatory of Paris, Sept. 28, 1876, by MM. Henry.—On the application of the methods of mathematical physics to the study of bodies terminated by cyclides, by M. Darboux.—New method for studying calorific spectra, by M. Aymonnet. With a constant heat-source, one may, even with a pretty large aperture of thermopile, find approximately the quantities of heat in spectral parts smaller than the aperture. Thus, suppose the pile is 1 mm. in aperture, you advance it (say) two-tenths of a millimetre at a time, noting each time the portion of spectrum passed from and the new part embraced. This is the principle of the method; by which M. Aymonnet gets some interesting results. The minima present a remarkable periodicity, and are displaced when the temperature of the source varies or a liquid screen is interposed.—Productions of carbonate of soda by the action of chloride of sodium in solution on carbonates of lime and magnesia, in presence of vegetable matters, by M. Pichard.—Researches on sensation compared with motion, by M. Richet. He formulates this general law as applicable both to muscles and to sensitive nerve centres: the number of excitations necessary to produce a perception or a motion is inversely proportional to the intensity and frequency of these excitations.—Experimental researches on the cardiac, vascular and respiratory effects of painful affections, by M. Franck. The immediate effect on the heat is always a stoppage or retardation of the beats.—On the form and reciprocal relations of the cellular elements of loose connective tissue, by M. Renaut.—Habits of fishes; the gourami and its nest, by M. Carbonnier.

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